Remarks

This is in response to the Office Action dated November 1, 2005.

Claims 1 to 11 and 15 to 24 were rejected as being unpatentable over Romesburg (US5966438) in view of Fujii (US5940499), and claims 12-14 were rejected as being unpatentable over Romesburg in view of Fujii and further in view of the Gerson article.

One of the main features of each of the currently amended independent claims is to estimate the environmental noise level independent of the input sound signal including the voice signal and an environmental noise signal.

Specifically, if the environmental noise level is estimated to depend on the input sound signal, variation in the level of voice signal may have a negative impact on the estimated environmental noise level. The noted main feature allows the negative impact on the estimated environmental noise level to be avoided.

In the independent claims, for example claim 1, when the variation detection means detects that the presently sampled level of the sound signal has increased from the previously sampled level, the estimation means would add a predetermined constant value to the previously estimated environmental noise level, thereby gradually varying the estimated environmental noise level from the previously estimated environmental noise level.

Thus, because the predetermined constant value is independent of the variation in the sound signal level, even if the presently sampled level of the sound signal were to increase from the previously sampled level, i.e., if the level of the input sound signal were to increase, the environmental noise level can be estimated independently of the variation (increase) in the sound signal level.

The independent estimate nature of the instant invention is pointed out in claim 1, for example, by the recitation of the estimation means that is responsive to a clock signal for estimating, renewing and outputting an estimated environmental noise level of the environmental noise signal, when the variation detection means detects that the presently sampled level increases from the previous sampled level. When the increase is detected, the estimated environmental noise level is gradually varied from the previously estimated environmental noise level by adding a predetermined constant value to the previously estimated noise level.

Romesburg (US 5,966,438) discloses an adapter volume control hands-free telephone in an automobile in which the ambient noises are allegedly reduced.

In the Office Action, the examiner asserts that "... it is noted that the disclosure of Romesburg merely provides a suggestion to control a noise suppression operation (36) in response to a noise estimate (38) and does not provide the explicit disclosure required to anticipate the variation detections means and estimation means of the claim. However, because Romesburg does not disclose the details of the nose estimation process or the noise suppression process, one of ordinary skill in the art is inherently motivated to provide operative solutions in the order to `fill-in the blanks' and practice the invention of Romesburg." Based on this rationale, the examiner then bootstraps his argument to support his combining the teachings of Fujii (US 5,940,499) with Romesburg for rejecting claim 1, and the other independent claims, as well as the claims dependent respective therefrom.

It is respectfully submitted that the "noise estimator 38" disclosed in Romesburg does not come close to the claimed estimation means of the pending claims. To wit, Romesburg discloses that his noise estimator 38 "monitors the output electrical audio signal and determines a portion of that signal which is noise ... This estimate of a noise portion of the signal is provided to a noise suppressor 36 where the noise portion of the output electrical output signal is reduced. In addition, a signal representing the amplitude of the noise is provided by a noise estimator 38 to the adaptive volume control 35. This

signal is used by the adapter volume control to select the amplitude of the sound to be produced by the loud speaker 25." (Column 6, lines 26-38, emphasis added.) Romesburg further went on to state that the noise estimate generated by his noise estimator 38 is not updated when the user speaks, so that the volume of the loudspeaker 25 is not increased. Thus, the user's voice is not included in the noise estimate (Column 7, lines 60-67).

Thus, the noise estimation process deemed by the examiner not to have been disclosed by Romesburg in fact is clearly disclosed to be used to determine a portion of the audio signal that is noise, and that noise portion is provided to the noise suppressor 36 to reduce the audio signal. Moreover, in determining the noise portion, the speaker's voice is filtered out.

In contrast, for the inventive environmental noise level estimation apparatus such as that set forth in claim 1, the detection means detects a level of the sound signal including a voice signal and an environmental noise signal. Moreover, the recited estimation means does not determine a portion of the overall signal that is noise. Rather, as clearly set forth in the independent claims including claim 1, the estimation means, in response to the detection by the variation detection means that the presently sampled level increases from the previously sampled level, would gradually vary the estimated environmental noise level from the previously estimated environmental noise level by adding a predetermined constant value thereto. Romesburg therefore does not come close to the instant invention.

Putting that aside, the reliance by the examiner of Fujii is also believed to be without merit in light of the following.

The examiner pointed out that Fig. 6 of Fujii shows noise estimation. Yet, a more careful reading of Fujii shows the following. Specifically, as clearly illustrated in Fig. 6, the noise level low pass-filter estimates a noise level by multiplying the input X signal (sound signal) by $(1-\alpha 1)$ using a multiplier 83 if the input signal X is equal to or higher than the delayed output signal Z. On the other hand, if the input sound signal X is lower than the

delayed output signal Z, the low pass-filter estimates a noise level by multiplying the input signal X by (1-α2) using the multiplier 83 (Column 7, line 59 to column 8, 1ine 11). Thus, for the Fujii device, the noise level is estimated to be the product of the input sound signal level X and either the value of (1-α1) or the value of (1-α2). Such estimation clearly depends on the variation in the input sound signal X.

The estimated noise level in Fujii, which depends on variation in the sound signal, therefore clearly contrasts with the noted main feature of each of the currently amended independent claims, i.e., the feature of estimation of the environmental noise level independent of the sound signal.

In sum, it is respectfully submitted that: (1) the noise estimator 38 in which the examiner has relied upon in Romesburg does not have much in common with the claimed estimation means of the instant invention, (2) the noise level low pass filter of Fujii operates dependent on the variation of the incoming noise signal in contrast to the claimed invention, and (3) a person skilled in the art would not have combined Fujii with Romesburg insofar as the Fujii device as shown in Fig. 6 is a noise level low pass filter, whereas the noise estimator disclosed in Romesburg is used for determining the noise portion of the signal.

In light of the foregoing, applicant respectfully submits that the instant invention is patentably distinguishable over the prior art. Accordingly, the examiner is respectfully requested to reconsider the application and pass the case to issue at an early date.

Respectfully submitted,

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Date: Feb 28, 2006